Commentary

Confronting the misinformation pandemic

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Medical misinformation is detrimental to the well-being and health of millions of individuals and is a significant threat to public health. Especially in the context of the Covid-19 vaccine rollout and distribution, developing sustainable and sound strategies to mitigate and combat misinformation is crucial. In the recent past, vaccine distrust, driven by the spread of misinformation, has steadily led to decreased immunization rates and increased deaths in the US and globally due to lack of vaccination [1]. Recent studies also demonstrate that online misinformation campaigns are associated with a drop in vaccination coverage over time, which presents considerable obstacles to achieving herd immunity in many countries worldwide [2].

Preexisting hesitancy to vaccination and the Covid-19 vaccine specifically have been significant in the US [3]. A recent Gallop Poll found that overall, 42% of US adults and 52% of non-white adults would refuse a vaccine [4]. This racial disparity in vaccine acceptance may be one factor in the current discrepancies in vaccinations in the US; across 40 states, the Covid-19 vaccination rate is almost twice as high as the rate for Hispanic people, and 1.7 times as high as the rate for Black people [5]. These concerning statistics highlight the racial disparities in the uptake of Covid-19 vaccines, which stem from factors such as access, structural racism, hesitancy, and mistrust of not just vaccines, but the healthcare system in general. Many states are beginning to implement strategies to address these disparities, such as purposely placing vaccine clinics in underserved areas or collaborating with community-based health centers to conduct effective communication and education, but

vaccine and healthcare distrust, coupled with lack of access, will continue to serve as major barriers to addressing racial equity in Covid-19 vaccine efforts [6].

Moreover, from a global perspective, an international vaccine confidence study conducted between 2015 and 2019 found that confidence in the importance of vaccines is most strongly associated with vaccine uptake, with receiving sound medical information also a significant factor [7]. This demonstrates how important it is to limit the spread of false information regarding vaccines and how the propagation of accurate medical advice should be prioritized. Misinformation also stems from many sources, ranging from word of mouth, social media channels, television, and popular entertainment and media organizations. Unfortunately, false news spreads faster than the truth, and the pandemic has concurrently created a vicious cycle in which individuals are consuming more news online due to health-related concerns, simultaneously increasing their exposure to misinformation [8]. With the increased information circulating online, this has created an "infodemic," described by the World Health Organization (WHO) as excess information in times of a pandemic, containing misinformation that causes confusion and further harms one's health [9]. Thus far, a wide spectrum of false conspiracy theories have already spread online, from claims that AstraZeneca's vaccine contains aborted fetal tissue, that the vaccine attacks a gene that impacts a person's spirituality, and that the vaccines contain microchips.

With this milieu of falsified claims, the landscape of uncertainty has

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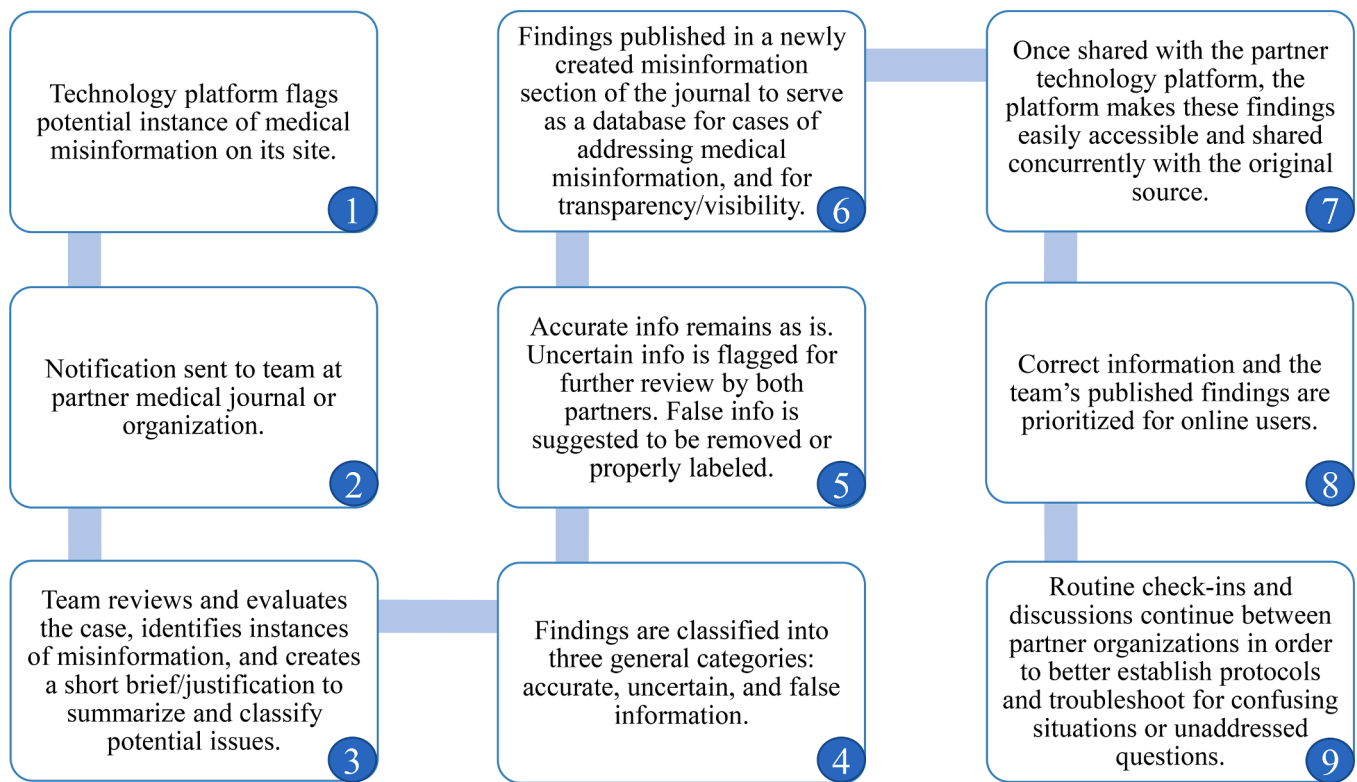|		
Technology platform flags potential instance of medical misinformation on its site. **1**	Findings published in a newly created misinformation section of the journal to serve as a database for cases of addressing medical misinformation, and for transparency/visibility. **6**	Once shared with the partner technology platform, the platform makes these findings easily accessible and shared concurrently with the original source. **7**
Notification sent to team at partner medical journal or organization. **2**	Accurate info remains as is. Uncertain info is flagged for further review by both partners. False info is suggested to be removed or properly labeled. **5**	Correct information and the team's published findings are prioritized for online users. **8**
Team reviews and evaluates the case, identifies instances of misinformation, and creates a short brief/justification to summarize and classify potential issues. **3**	Findings are classified into three general categories: accurate, uncertain, and false information. **4**	Routine check-ins and discussions continue between partner organizations in order to better establish protocols and troubleshoot for confusing situations or unaddressed questions. **9**

Fig. 1. Workflow of partnership between technology platform and medical journal/organization.

only grown since the development of the vaccine. Therefore, immediate, organized action is needed to rebuild trust in public health systems. Methods to address negative and false discourse about Covid-19 and health safety measures, as well as anti-vaccination content, are essential. However, action cannot be one-sided; instead, progress must be collaborative in order to be sustainable and far-reaching. Therefore, we provide recommendations for coordinated action by the global corporate and scientific community to strengthen the credibility of professional expertise and directly confront the misinformation pandemic and vaccine hesitancy.

Recently, there have been public calls to action by medical professional societies to address medical misinformation, suggestions for medical journals to actively counteract misinformation, and even recommendations for collaboration between social media editors of medical organizations [10,11]. Concurrently, social media and technology companies such as Google, Facebook, and Twitter are establishing methods to track, identify, and act on misinformation by labeling false claims, increasing access to fact-checked information, and removing false information that will harm the public's health [12].

While these ongoing efforts are much needed, increased active partnerships between public health researchers, healthcare organizations, medical journals, and technology companies could dramatically increase the effectiveness of existing efforts. These strategically coordinated partnerships would allow those with the most expertise and credibility to collaborate with those disseminating and publishing information online to be consumed by the public. Stopping the amplification cascade of misinformation at the individual user level or at the source of the disinformation is very challenging. However, it is realistic to counter misinformation by creating spaces on social media and professional media that embody active collaboration between those platforms and physicians, scientists, and medical journals and organizations (Fig. 1).

The WHO and Wikipedia recently announced a new partnership to address coronavirus misinformation [13]. By sharing official WHO data on addressing Covid-19 misinformation through Wikipedia's platform, both organizations hope to provide equitable access to trusted and true health information to as many as possible. Medical journals and scientific organizations could build on this innovative approach by creating teams dedicated toward monitoring and addressing misinformation, with support from a partner technology or social media company. This collaborative effort could allow analysts to flag potentially confusing instances of medical misinformation and send alerts to a small but effective group of scientific experts, who could definitively identify misinformation so that it would be appropriately managed online. Their findings would be published in a misinformation section of the journal or organization's website, and concurrently shared on the respective social media or search engine platform, allowing for equitable and open access. This collaboration would assist technology companies in prioritizing correct information in search engines and making evidence-based decisions to remove or label false information on their platforms.

As clear criteria for misinformation are established, a shared protocol could be created in partnership with medical organizations globally, and subsequently be improved and adapted to different misinformation situations and different platforms. This not only raises awareness and increases scientific literacy, but also encourages a change in mindset towards not trying to prevent misinformation, but to find innovative methods to manage it effectively. Such an approach increases the visibility of credible scientific and medical organizations, further supporting awareness and education. For technology companies, these actions bolster preexisting measures to address misinformation, and allow them to rely on expertise from credible and longstanding leaders in science and medicine. Importantly, these partnerships also improve the public perception of science and offer collaborative strategies to address misinformation effectively and sustainably, especially in a current period in which vaccine misinformation is directly contributing to hesitancy, distrust, and reduced uptake [14].

Combatting medical misinformation during a pandemic can seem like a Sisyphean task, but there are effective and actionable steps that healthcare providers, professional societies, medical journals, and technology companies can take, especially in cooperation with each

other. Misinformation will always exist—the generators of misinformation have no incentive to cease, and so it is the responsibility of individuals, organizations, and technology companies to collaboratively ensure no oxygen is provided for the flames of misinformation. Even more so now, during the pandemic and the continually growing reliance on online platforms for information consumption, the professionals and organizations that make up healthcare and medicine should be highly motivated to address medical misinformation, for the health of patients and the well-being of all. To prevent future infections and deaths from Covid-19, it is critical that true medical information about the safety and efficacy of vaccines is communicated to all communities.

Funding

None.

Ethical approval

Not required.

Declaration of Competing Interest

None declared.

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